**Reading Four**

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CHAPTER 8

Cognitive Theories of Bilingualism and the Curriculum

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CHAPTER 8

Cognitive Theories of Bilingualism and the Curriculum

INTRODUCTION

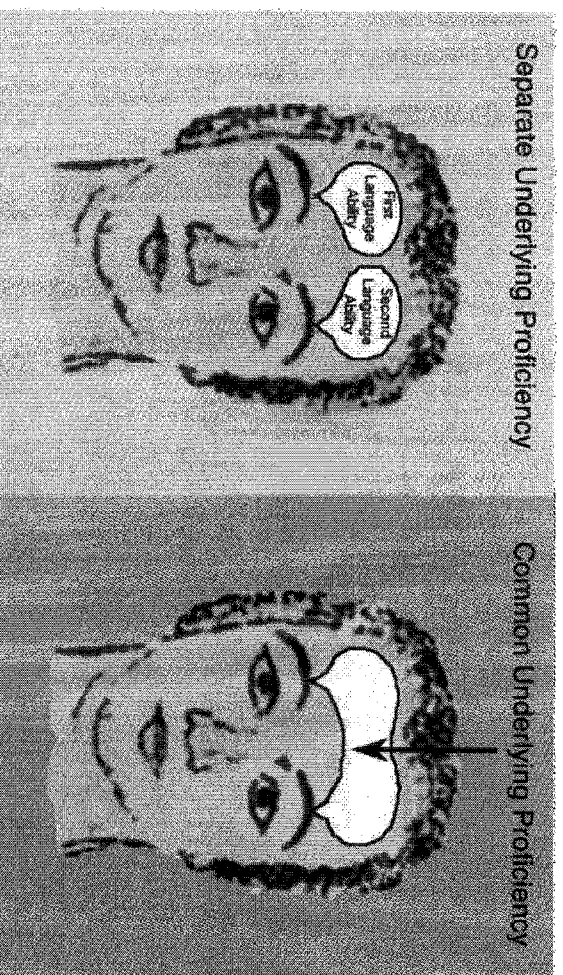
The previous chapter examined the relationship between bilingualism and cognition. The discussion was primarily based on research findings and culminated in explanations of the likely positive relationship between bilingualism and thinking processes and products. This chapter extends that discussion of explanations by firstly considering a 'naive' theory of language and cognitive functioning; then, secondly, examining the development of a major and dominating theory of bilingualism and cognition. The culmination of the chapter is a discussion of how this evolved theory has direct curriculum implications.

THE BALANCE THEORY

The previous chapter noted that initial research into bilingualism and cognitive functioning and into bilingualism and educational attainment often found bilinguals to be inferior to monolinguals. This connects with a naive theory of bilingualism that represents the two languages as existing together in **balance**. The picture is of weighing scales, with a second language increasing at the expense of the first language. An alternative naive picture-theory attached to the early research is of **two language balloons** inside the head. The picture portrays the monolingual as having one well filled balloon. The bilingual is pictured as having two less filled or half filled balloons. As the second language balloon is pumped higher (e.g. English in the US), so the first language balloon (e.g. Spanish) diminishes in size, leading to confusion, frustration and failure.

The balance and balloon picture theories of bilingualism and cognition appear to be held intuitively by many people. Many parents and teachers, politicians and

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large sections of the public appear to latently, subconsciously take the balloon picture as the one that best represents bilingual functioning. Cummins (1980a) termed this the **Separate Underlying Proficiency Model of Bilingualism**. This model conceives of the two languages operating separately without transfer and with a restricted amount of 'room' for languages. As Bialystok (2001a, p. 59) argues: 'nothing we know about memory substantiates these fears. Indeed, the fact that millions of children routinely grow up with more than one language in their environment and appear to suffer no obvious trauma should allay the concerns of most parents'.

What appears logical is not always psychologically valid. While both the balance or balloon ideas are plausible, neither fits the evidence. As the previous chapter concluded, when children become relatively balanced bilinguals, the evidence suggests that there are cognitive advantages rather than disadvantages for being bilingual. Similarly, chapters 11 and 12 will show that certain types of bilingual education (e.g. early total immersion and heritage language bilingual education) appear to result in performance advantages (e.g. in two languages and in general curriculum performance) compared with submersion or monolingual education.

Research has also suggested that it is wrong to assume that the brain has only a limited amount of room for language skills, such that monolingualism is preferable (see chapter 7). There appears to be enough cerebral living quarters not only for two languages, but for other languages as well. The picture of the weighing scales, of one language increasing at the expense the second language, does not fit the data. Other pictures, provided later in this chapter, better encapsulate research findings.

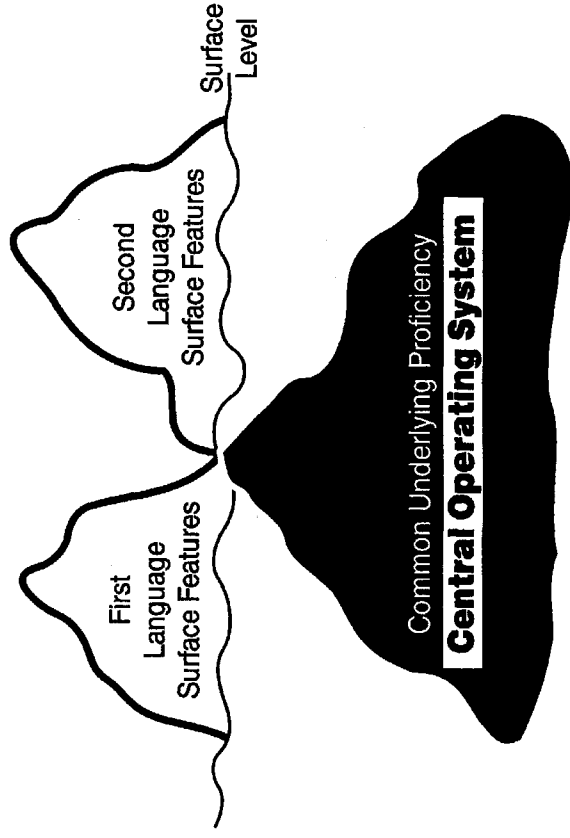
There is another fallacy with the balance or balloon theory. The assumption of this theory is that the first and second language are kept apart in two 'balloons' inside the head. The evidence suggests the opposite – that language attributes are not separated in the cognitive system, but transfer readily and are interactive. For

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example, when school lessons are through the medium of Spanish, they do not solely feed a Spanish part of the brain. Or when other lessons are in English, they do not only feed the English part of the brain. Rather concepts learnt in one language can readily transfer into the other language. Teaching a child to multiply numbers in Spanish or use a dictionary in English easily transfers to multiplication or dictionary use in the other language. A child does not have to be re-taught to multiply numbers in English. A mathematical concept can be easily and immediately used in English or Spanish if those languages are sufficiently well developed. Such easy exchange leads to an alternative idea called **Common Underlying Proficiency** (Cummins, 1980a, 1981a).

THE ICEBERG ANALOGY

Cummins' (1980a, 1981a) **Common Underlying Proficiency model** of bilingualism can be pictorially represented in the form of two icebergs (see below). The two icebergs are separate above the surface. That is, two languages are visibly different in outward conversation. Underneath the surface, the two icebergs are fused so that the two languages do not function separately. Both languages operate through the same central processing system.



The **Common Underlying Proficiency** model of bilingualism may be summarized in six parts:

- (1) Irrespective of the language in which a person is operating, the thoughts that accompany talking, reading, writing and listening come from the **same central engine**. When a person owns two or more languages, there is one integrated source of thought.

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- (2) Bilingualism and multilingualism are possible because people have the **capacity to store** two or more languages. People can also function in two or more languages with ease.
- (3) Information processing skills and educational attainment may be developed through **two languages** as well as through one language. Cognitive functioning and school achievement may be fed through one monolingual channel or equally successfully through two well developed language channels. Both channels feed the same central processor.
- (4) The language the child is using in the classroom needs to be sufficiently **well developed** to be able to process the cognitive challenges of the classroom.
- (5) Speaking, listening, reading or writing in the first or the second language helps the whole cognitive system to develop. However, if children are made to operate in an **insufficiently developed** second language (e.g. in a 'submersion' classroom – see chapter 10), the system will not function at its best. If children are made to operate in the classroom in a poorly developed second language, the quality and quantity of what they learn from complex curriculum materials and produce in oral and written form may be relatively weak and impoverished. This was the experience of some Finns in Swedish schools operating in Swedish (Skutnabb-Kangas & Toukomaa, 1976). Such children tended to perform poorly in the curriculum in both Finnish and Swedish because both languages were insufficiently developed to cope with relatively complex curriculum material.
- (6) When one or both languages are **not functioning fully** (e.g. because of pressure to replace the home language with the majority language), cognitive functioning and academic performance may be negatively affected.

The distinction between Separate Underlying Proficiency (SUP) and Common Underlying Proficiency models of bilingualism (CUP) does not fully sum up the findings from research on cognitive functioning and bilingualism. For example, the continuing debate on the Sapir-Whorf hypothesis (e.g. that different languages intrinsically lead to different views of the world) challenges the idea that bilinguals have one integrated source of thought (Pavlenko, 2005a). Language influences both the content and process of thinking. Thus varied languages can influence thought differently through their structure and particularly through their customary discourse, concepts and meanings. If this is so, second language learning may augment and enhance a person's understandings, views and ideas. It may offer alternative and extra meanings. The extent to which bilinguals change their thinking when changing languages is complex without a simple 'black or white' answer (see Pavlenko, 2005a). Translation of meaning can occur across languages, yet some enduring **relativity** within a language seems also to occur.

THE THRESHOLDS THEORY

Many studies have suggested that the further the child moves towards balanced bilingualism, the greater the likelihood of cognitive advantages (e.g. Cummins &

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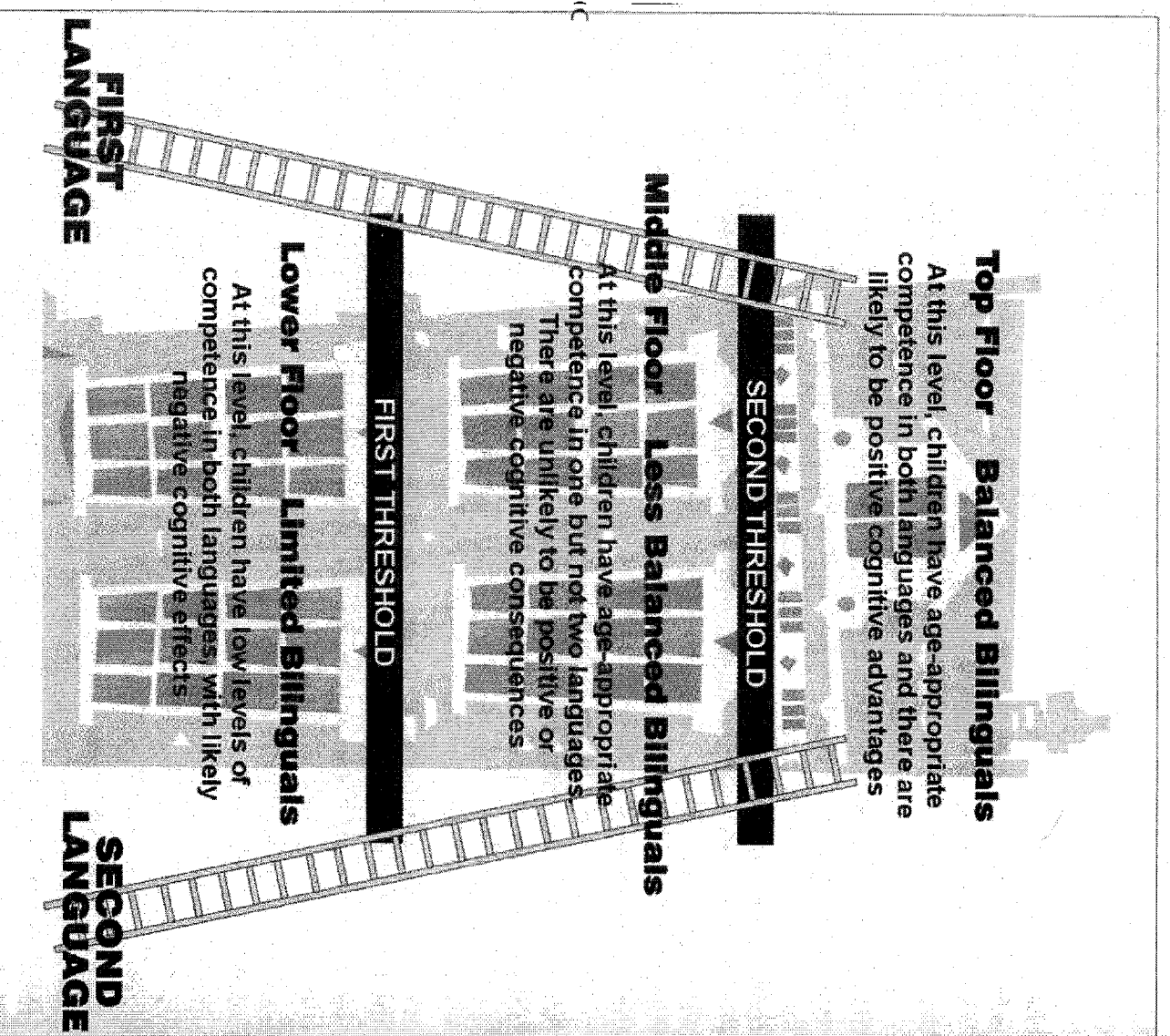
Mulcahy, 1978; Duncan & de Avila, 1979; Kessler & Quinn, 1982; Dawe, 1982, 1983; Clarkson, 1992; Cummins, 2000b; Bialystok, 2001a). Thus the question has become 'Under what conditions does bilingualism have positive, neutral and negative effects on cognition?' How far does someone have to travel up the two language ladders to obtain cognitive advantages from bilingualism?

One theory that partially summarizes the relationship between cognition and degree of bilingualism is called the **Thresholds Theory**. This was first postulated by Toukoma and Skutnabb-Kangas (1977) and by Cummins (1976). They suggested that the research on cognition and bilingualism is best explained by the idea of two thresholds. Each threshold is a level of language competence that has consequences for a child. The first threshold is a level for a child to reach to avoid the negative consequences of bilingualism. The second threshold is a level required to experience the possible positive benefits of bilingualism. Such a theory therefore limits which children will be likely to obtain cognitive benefits from bilingualism. It also suggests that there are children who may derive detrimental consequences from their bilingualism.

The Thresholds Theory may be portrayed in terms of a house with three floors (see the following diagram). Up the sides of the house are placed two language ladders, indicating that a bilingual child will usually be moving upward and will not usually be stationary on a floor. On the **bottom floor** of the house will be those whose current competence in both their languages is insufficiently or relatively inadequately developed, especially compared with their age group. When there is a low level of competence in both languages, there may be negative or detrimental cognitive effects. For example, a child who is unable to cope in the classroom in either language may suffer educationally. At the **middle level**, the second floor of the house, will be those with age-appropriate competence in one of their languages but not in both. For example, children who can operate in the classroom in one of their languages but not in their second language may reside in this second level. At this level, a partly-bilingual child will be little different in cognition from the monolingual child and is unlikely to have any significant positive or negative cognitive differences compared with a monolingual. At the top of the house, the **third floor**, there resides children who approximate 'balanced' bilinguals. At this level, children will have age-appropriate competence in two or more languages. For example, they can cope with curriculum material in either of their languages. It is at this level that the positive cognitive advantages of bilingualism may appear. When a child has age-appropriate ability in both their languages, they may have cognitive advantages over monolinguals.

Research support for the **Thresholds Theory** comes, for example, from Bialystok (1988), Clarkson and Galbraith (1992), Clarkson (1992), Dawe (1983) and Cummins (2000b). Dawe's (1983) study examined bilingual Panjabi, Mirpuri and Jamaican children aged 11 to 13. On tests of deductive mathematical reasoning, Dawe (1983) found evidence for both the lower and the higher threshold. As competency in two languages increased, so did deductive reasoning skills in mathematics. Limited competence in both languages appeared to result in negative cognitive outcomes.

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Bialystok (1988) examined two aspects of metalinguistic awareness (analysis of linguistic knowledge and control of linguistic processing) in six- to seven-year-old monolingual, partial bilingual and fluently French–English children. She found that 'the level of bilingualism is decisive in determining the effect it will have on development' (p. 567).

The Thresholds Theory relates not only to cognition but also to education. With children in Immersion Education (e.g. in Canada – see chapters 11 and 12), there is usually a temporary lag in achievement when the curriculum is taught through the second language. Until the second language (e.g. French) has developed well

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enough to cope with curriculum material, a temporary delay may be expected. Once French is developed sufficiently to cope with the conceptual tasks of the classroom, Immersion Education is unlikely to have detrimental achievement consequences for children. Indeed, such an immersion experience seems to enable children to reach the third floor of the house, with resulting positive cognitive advantages (Cummins, 2000b).

The Thresholds Theory also helps to summarize why minority language children taught through a second language (e.g. immigrants in the US) sometimes fail to develop sufficient competency in their second language (e.g. English) and fail to benefit from 'weak' forms of bilingual education (see chapter 10). Their **low level of proficiency** in English, for example, limits their ability to cope with the curriculum. Therefore Dual Language programs, that allow a child to operate in their more developed home language, can result in superior performance compared with submersion and transitional bilingual education (see chapter 10).

A **problem** with the Thresholds Theory is in precisely defining the level of language proficiency a child must obtain in order, firstly to avoid the negative effects of bilingualism, and secondly, to obtain the positive advantages of bilingualism. At what language 'height' the ceilings become floors is not clear. Indeed, the danger may be in constructing artificial 'critical stages' or levels, when transition is gradual and smooth. This point is returned to in the following section.

THE EVOLUTION OF THE THRESHOLDS THEORY

From out of the Thresholds Theory developed a succession of more refined theories of bilingualism. The first evolution of the Thresholds Theory considered the relationship between a bilingual's two languages. To this end, Cummins (1978, 2000a, 2000b) outlined the language **Developmental Interdependence hypothesis**.

This hypothesis suggests that a child's second language competence is partly dependent on the level of competence already achieved in the first language. The more developed the first language, the easier it will be to develop the second language. When the first language is at a low stage of evolution, it is more difficult to achieve bilingualism. Huguet *et al.* (2000) found that the Linguistic Developmental Interdependence hypothesis was supported in research on the language competence of Spanish/Catalan speakers of varying balance. For example, those 12-year-old students who knew more Catalan also knew more Spanish, and vice versa. Similarly, in research on 952 Miami, Florida, students in Dual Language and English Immersion schools, it was found that this hypothesis helped explain the reading and writing results (see Oller & Eilers, 2002). For example, 'children did not tend to excel in one language at the expense of the other' (Cobo-Lewis *et al.*, 2002, p. 120) and there appeared to be a positive transfer of skills and concepts from one language to another. Proctor's (2003) sophisticated analysis of data Spanish / English 4th grade data from Boston, Chicago and El Paso showed that students with well-developed Spanish and English vocabularies outperformed their less bilingual (e.g. Spanish dominant, English dominant) counterparts in English reading

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achievement. Such findings also appear to hold for learning a third language (Errasti, 2003; Cenoz, 2003).

Alongside this, there developed a distinction between surface fluency and the more evolved language skills required to benefit from the education process (Cummins, 1984a). This was partly a reaction against Oller (1979) who claimed that language proficiency differences between individuals were located on just one dimension (see chapter 1). Cummins (1979) found that everyday conversational language could be acquired in two years while the more complex language abilities needed to cope with the curriculum could take five to seven or more years to develop. In California, Hakuta *et al.* (2000) found that English oral proficiency takes three to five years to develop, while academic English proficiency can take **four to seven years**. This makes calls for English immersion schooling for immigrants (see chapters 9 to 13), where children are expected to acquire English in just one year, unrealistic and damaging.

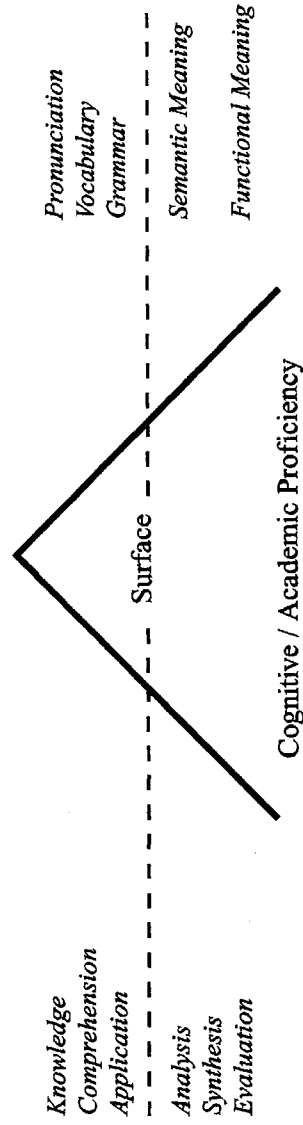
Simple communication skills (e.g. holding a simple conversation with a shop-keeper) may hide a child's relative inadequacy in the language proficiency necessary to meet the cognitive and academic demands of the classroom. The language used when playing with a ball in the school playground is very different from 'calculate, using a protractor, the obtuse angle of the parallelogram and then construct a diagonal line between the two obtuse angles and investigate if this creates congruent triangles'. Teaching **mathematics**, for example, in multilingual classrooms requires particular care with language (Adler, 2001; Barwell, 2002, 2005a, 2005b; Frederickson & Cline, 2002; Leung, 2005). The mathematical use of words such as adjacent, difference, mean, opposite, base, chord, even, odd, angle, parallel, power, product, prime, root, similar, solid, table, takeaway, times and value all differ from vernacular usage: mathematics problems are often word problems. Children may need to negotiate each other's mathematics language (e.g. altogether, share, each, disappear, joined, extra, times, left – see Barwell, 2002). Frederickson and Cline (2002) also suggest that, particularly for those being taught in their second language (e.g. English), it is 'not just the vocabulary of maths that causes difficulty. The syntax in which mathematical ideas are expressed is often more complex than children are accustomed to in other areas of the curriculum' (p. 347).

Cummins (1984a, 1984b, 2000b) expressed this distinction in terms of **basic interpersonal communicative skills (BICS)** and **cognitive/academic language proficiency (CALP)**. BICS is said to occur when there are contextual supports and props for language delivery. Face-to-face '**context embedded**' situations provide, for example, non-verbal support to secure understanding. Actions with eyes and hands, instant feedback, cues and clues support verbal language. CALP, on the other hand, is said to occur in **context reduced** academic situations. Where higher order thinking skills (e.g. analysis, synthesis, evaluation) are required in the curriculum, language is '**disembedded**' from a meaningful, supportive context. Where language is 'disembedded', the situation is often referred to as '**context reduced**'.

The distinction between BICS and CALP is aided by an image of an iceberg (see

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Cummins, 1984b). Above the surface are BICS language skills such as comprehension and speaking. Underneath the surface are the CALP skills of analysis and synthesis. Thus, above the surface are the basic language skills of pronunciation, vocabulary and grammar. Below the surface are the deeper, subtle language skills of meanings and creative composition.



The BICS/CALP distinction has been influential and valuable for policy and practice. It was never intended as contextually universal, a complete theory, or to indicate when second language reading (e.g. English in the US) or cognitively challenging content instruction in English should be introduced. Indeed, the conceptual distinction has been unfairly criticized for the absence of many components it was never intended to contain (see Cummins, 2000a, 2000b). However, before leaving this BICS/CALP distinction, it is important to declare its boundaries and limitations (see Wiley, 1996a, 2005c; MacSwan & Rolstad, 2003).

- (1) The distinction between BICS and CALP has intuitive appeal and does appear to fit the case of children who are seemingly fluent in their second language, yet cannot cope in the curriculum in that language. However, it only paints a two-stage idea. A large number of dimensions of language competences exist (see chapter 1). Children and adults may move forward on language dimensions in terms of sliding scales rather than in big jumps. Such development is like gradually increasing in language competence analogous to increasing gradually the volume on a television set. A bilingual's language competences are evolving, dynamic, interacting and intricate. They are not simple dichotomies, easily compartmentalized and static.
- (2) The BICS/CALP distinction enabled an understanding and explanation of previous research (e.g. Wong Fillmore, 1979; Snow & Hoefnagel-Höhle, 1978; Cummins, 1984b, 2000b). However, Martin-Jones and Romaine (1986) express doubts about testing the distinction. The distinction between BICS and CALP does not indicate how the two ideas may be precisely defined and accurately tested. Thus the distinction becomes difficult to operationalize in research.
- (3) Terms such as BICS and CALP tend to be imprecise and become over-compartmentalized, simplified and misused. These hypothetical terms may

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unwittingly be regarded as real entities. Such terms may be used to label and stereotype students, especially if BICS is seen as inferior to CALP (Wiley, 1996a, 2005c).

- (4) The relationship between language development and cognitive development is not unequivocal or simple. It is not simply a case of one growing as a direct result of the other. Cognitive and linguistic acquisition exist in a relationship that is influenced by various other factors (e.g. politics, power relationships, social practices, culture, context, motivation, school, home and community effects). Language proficiency relates to an individual's total environment, not just to cognitive skills.
- (5) The sequential nature of BICS first and then CALP is a typical route for immigrant children learning a second language. However, the order is not absolute. Occasionally there will be exceptions (e.g. a scholar who reads a language for research purposes but does not speak that language).
- (6) CALP may relate to an ability to perform well on school tests (test-wisdom). This relates to specific, traditional, school-based literacy practices. Such practices favor the middle-class groups that control institutions. Such tests favor 'standard' academic language with a bias against speakers of dialects, Creoles and non-standard language (e.g. Black English). MacSwan and Rolstad (2003) argue that the theory gives special status to educated, middle class language styles and hence belittles working class oral language styles. This hides a deficit view of language that stigmatizes non-academic language. This was certainly not Cummins' intention (Baker & Hornberger, 2001) and given that this theory has persuaded many educators not to prematurely mainstream English language learners especially in the US, the theory has not had this effect. However, MacSwan & Rolstad (2003) introduce the term SLIC: second language instructional competence that refines terminology.
- (7) Oral language and interpersonal communication is not necessarily less cognitively demanding than literate academic language. For example, careful logic, metaphor and other abstract aspects of language occur in face-to-face communication and not just in written language.
- (8) School-based academic/cognitive language does not represent universal higher-order cognitive skills nor all forms of literacy practice. Different sociocultural contexts have different expectations and perceived patterns of appropriateness in language and thinking such that a school is only one specific context for 'higher order' language production.

The distinction between BICS and CALP helps explain the relative failure within the educational system of many minority language children. For example, in the United States, various programs (see chapter 10) aim to give language minority students sufficient English language skills to enable them to converse with peers and teachers and to operate in the curriculum. Having achieved surface fluency, they may be transferred to regular classes. The transfer occurs because children appear to have sufficient language competence (BICS) to cope in mainstream

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education. Cummins' (1984a) distinction between BICS and CALP explains why such children tend to fail when mainstreamed. Their cognitive academic language proficiency is not developed enough to cope with the demands of the curriculum. What Cummins (1984a) regards as essential in the bilingual education of children is that the 'common underlying proficiency' be well developed. That is, a child's language-cognitive abilities need to be sufficiently well developed to cope with the curriculum processes of the classroom. This underlying ability could be developed in the first or the second language, but also in both languages simultaneously.

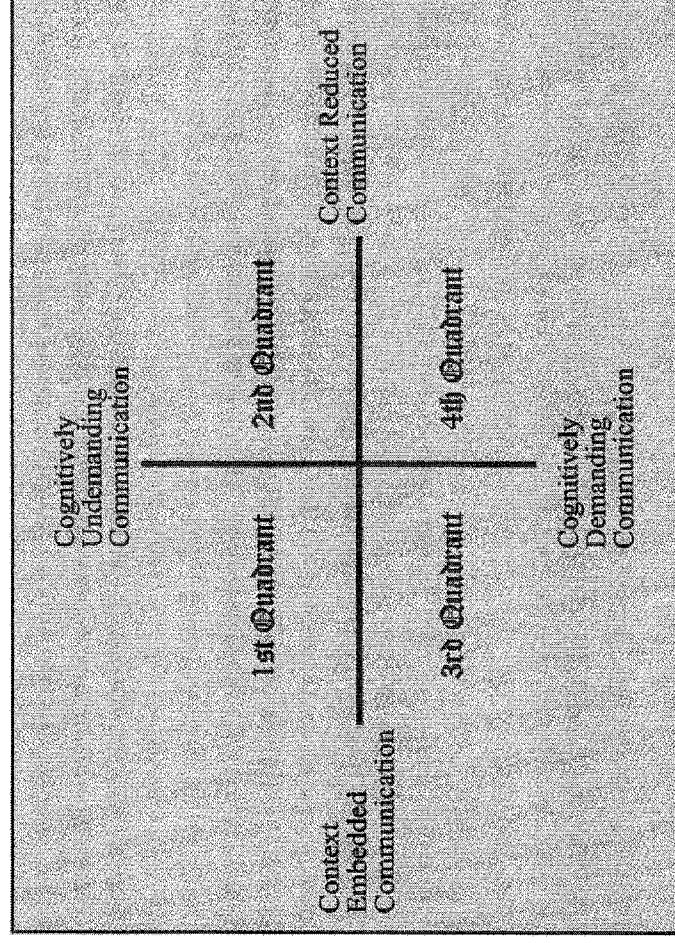
Cummins (2000a, 2000b) has extended the instructional implications of CALP in terms of three components: Cognitive, Academic and Language.

Cognitive: instruction should be cognitively challenging using higher order thinking skills such as evaluating, inferring, generalizing and classifying.

Academic: curriculum content should be integrated with language instruction so that students learn the language of specific academic areas.

Language: critical language awareness should be developed both linguistically (e.g. conventions of each language) and socioculturally/sociopolitically (e.g. different status and power with languages, language use).

A further development of this theory proposed two dimensions (Cummins, 1981b, 1983b, 1984b). This theory is represented in the diagram below:



Both dimensions concern communicative proficiency. The **first dimension** refers to the amount of contextual support available to a student. **Context embedded communication** exists when there is a good degree of support in communication, particularly via body language. For example, by pointing to objects, using the eyes, head nods, hand gestures and intonation, people give and receive plenty of clues and cues to help the content of the message to be understood.

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An example of context embedded communication would be when two children who are hardly able to use each other's languages seem able to communicate quite well by gestures, non-verbal reinforcements and bodily movements. It is not infrequent to see two young children of different languages playing together without difficulty. In **context reduced communication** there will be very few cues to the meaning that is being transmitted. The words of the sentence exist almost alone in conveying the meaning. An example of context reduced communication is often the classroom where the meaning is restricted to words, with a subtlety and precision of meanings in the vocabulary of the teacher or the book.

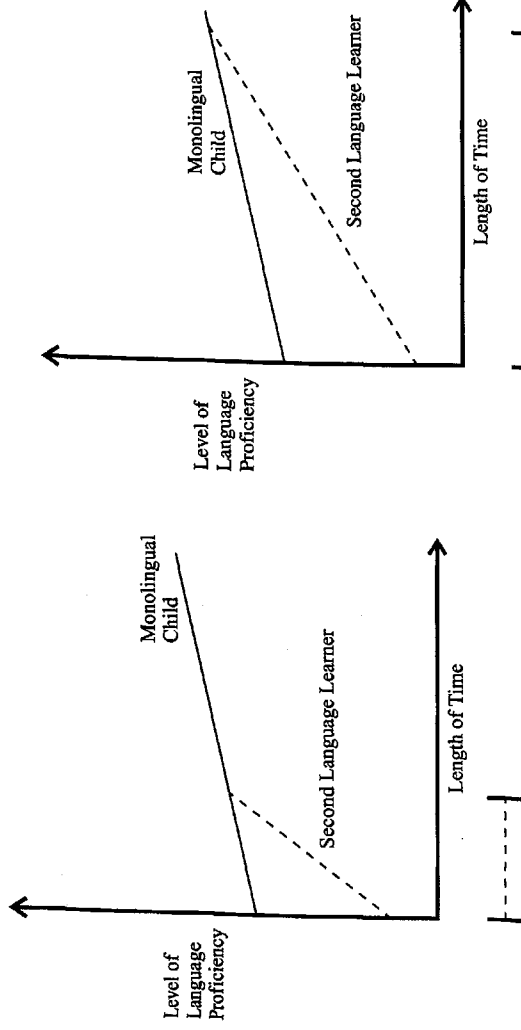
The **second dimension** is the level of cognitive demands required in communication. **Cognitively demanding communication** may occur in a classroom where much information at a challenging level needs processing quickly. **Cognitively undemanding communication** is where a person has the mastery of language skills sufficient to enable easy communication. An example would be having a conversation in the street, shop, or stadium, where the processing of information is relatively simple and straightforward.

Surface fluency or basic interpersonal communication skills will fit into the first quadrant (see diagram). That is, BICS (basic interpersonal communication skills) is context embedded, cognitively undemanding use of a language. Language that is cognitively and academically more advanced (CALP) fits into the fourth quadrant (context reduced and cognitively demanding). Cummins' (1981b) theory suggests that second language competency in the first quadrant (surface fluency) develops relatively independently of *first* language surface fluency. In comparison, context reduced, cognitively demanding communication develops inter-dependently and can be promoted by either language or by both languages in an interactive way. Thus, the theory suggests that bilingual education will be successful when children have enough first or second language proficiency to work in the context reduced, cognitively demanding situation of the classroom.

The quadrants can act as a guide for **instructional planning**. A teacher valuably takes into account students' linguistic development and experience, as well as their understanding of the topic. Then the teacher can create activities or experiences that are cognitively challenging and contextually supported as needed. This will be exemplified in the next section of this chapter.

For Cummins (1981b, 2000b) it often takes one or more years for a child to acquire context-embedded second language fluency, but five to seven years or more to acquire context-reduced fluency. This is illustrated in the graphs on the following page. Research by Hakuta and D'Andrea (1992) with Mexican-Americans found that 'English proficiency reaches asymptotic performance after about eight years. This corresponds quite well with the figures of five to seven years required for attainment of the full range of second language acquisition as estimated by Cummins (1984a) based on a heterogeneous L1 population in Canada' (p. 96). In the San Francisco Bay Area, Hakuta *et al.* (2000) found that social English takes three to five years to develop, while academic English can take four to seven years. Collier (1989, 1992) suggests that as many as ten years are needed to catch-up on academic

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It takes approximately **two** years for the second language learner to reach the same level of proficiency as a monolingual in **context embedded** language proficiency

It takes approximately **five to eight** years for the second language learner to reach the same level of proficiency as the monolingual in **context reduced** language proficiency

language abilities. Shohamy (1999) found that seven to nine years are needed for heterogeneous immigrant students in Israel to catch-up with native speakers in Hebrew literacy. Such native-speakers are not standing still in language development. The immigrants are chasing a moving target.

Spada and Lightbown (2002) found failure among Inuit students in northern Quebec because they experience a transition from their home language (used in Kindergarten to Grade 2) to education almost solely in French or English. This results in many students working in classrooms where the cognitively demanding language is beyond their grasp. This was continued from elementary to secondary school, with particularly severe problems at High school level with its needs for more abstract academic language. The lack of **age-appropriate** French language ability is regarded as the principal cause of academic failure.

Children with some conversational ability in their second language may falsely appear ready to be taught through their second language in a classroom. Cummins's (1981b) theory suggests that children operating at the context embedded level in the language of the classroom may fail to understand the content of the curriculum and fail to engage in the higher order cognitive processes of the classroom, such as synthesis, discussion, analysis, evaluation and interpretation.

This two-dimensional model helps explain various research findings:

- (1) In the **United States**, language minority children sometimes move from being classified as LEP (Limited English Proficiency) or EL (English Learners) to FEP (Fluent English Proficient) as soon as their conversational ability in English seems sufficient (Linquanti, 2001). Such students then frequently perform

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poorly. The theory suggests that this is due to their not having the developed ability in 'curriculum' or 'grade level' English (or their home language) to operate in an environment that is more cognitively and academically demanding. Linqianti (2001) suggests that a common notion among US politicians, policymakers and educators is that 'students only need to learn English and their academic achievement will naturally follow' (p. 6). Reclassification too quickly and prematurely to FEP may put language minority students at academic risk as language supports are withdrawn.

- (2) Immersion students in **Canada** tend to lag behind their monolingual peers for a short period. Once they acquire second language proficiency sufficient to operate in a cognitively demanding and context reduced environment, they usually catch up with their peers.
- (3) Experiments in the United States, Canada and Europe with minority language children who are allowed to use their minority language for part or much of their elementary schooling show that such children do not experience retardation in school achievement or in majority language proficiency. Through their minority language, they develop the ability to be relatively successful in the cognitively demanding and context reduced classroom environment (Secada, 1991). This ability then **transfers** to the majority language when that language is sufficiently well developed. Children learning to read in their home language are not just developing home language skills. They are also developing higher order cognitive and linguistic skills that will help with the future development of reading in the majority language as well as with general intellectual development. As Cummins (1984a) noted, 'transfer is much more likely to occur from minority to majority language because of the greater exposure to literacy in the majority language and the strong social pressure to learn it' (p. 143).

CURRICULUM RELEVANCE

What a student brings to the classroom in terms of previous learning is a crucial starting point for the teacher. A student's reservoir of knowledge, understanding and experience can provide a meaningful context on which the teacher can build (Robson, 1995). For example, there will be occasions when a student will learn more from a story read by the teacher than listening to a language tape. When the teacher dramatizes a story by adding gestures, pictures, facial expressions and other acting skills, the story becomes more context-embedded than listening to a tape cassette. Getting a student to talk about something familiar will be cognitively less demanding than talking about something culturally or academically unfamiliar. This means that any curriculum task presented to the student needs considering for the following points:

- what the task requires of the child; the cognitive demands inherent in the task (as found by an individual child); the 'entry skills' that a task necessitates. This is illustrated below;

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- form of presentation to the child (degree of context embeddedness or context reduction); what form of presentation will be meaningful to the child; use of visual aids, demonstration, modeling, computers, oral and written instructions; amount of teacher assistance. This is extended in Mohan's (2001) Knowledge Framework and exemplified in Tang (2001);
- the child's language proficiencies;
- the child's previous cultural and educational experience and knowledge, individual learning style and learning strategies; expectations and attitudes, confidence and initiative; the child's familiarity with the type of task;
- what is acceptable as evidence that learning has successfully occurred; what constitutes mastery or a sufficient approximation; an appropriate form of 'formative' and 'summative' assessment (see chapters 2 and 15) that may be gestural, action (e.g. building a model), drawing, oral or written (Robson, 1995);

Cognitively undemanding	
Greeting someone	Recites nursery rhymes
Talking about today's weather	Listens to a story or poem
Tells their own stories	Describes a story on TV
Describes what they have just seen	Copies information from a screen or text
Compares and contrasts	Reflects on feelings
Summarizes	Argues a case
Recalls and reviews	Sustains and justifies an opinion
Solution seeking to problems	Evaluates and analyzes critically
Explains and justifies	Interprets evidence
Role play	Applies principles to a new situation
Cognitively demanding	

Context
embedded

Context
reduced

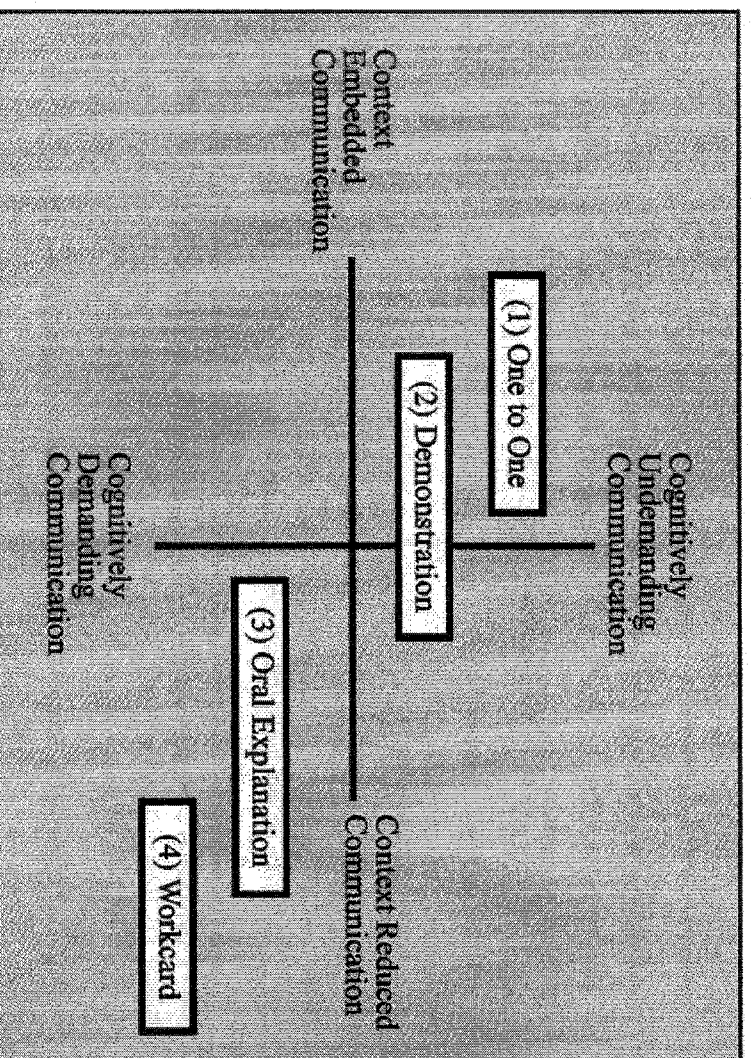
A simple example of using the two dimensions to produce an appropriate **teaching strategy** is now presented (see Frederickson & Cline, 1990, 2002; Cline & Frederickson, 1995, 1996; Hall *et al.*, 2001, plus Sjöholm, 2004, for an example in a trilingual context).

A teacher wants a group to learn how to measure height and to understand the

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concept of height. Listed below are a few of the teaching strategies for teaching about height. Following the list is a diagram placing the four strategies on the two dimensions:

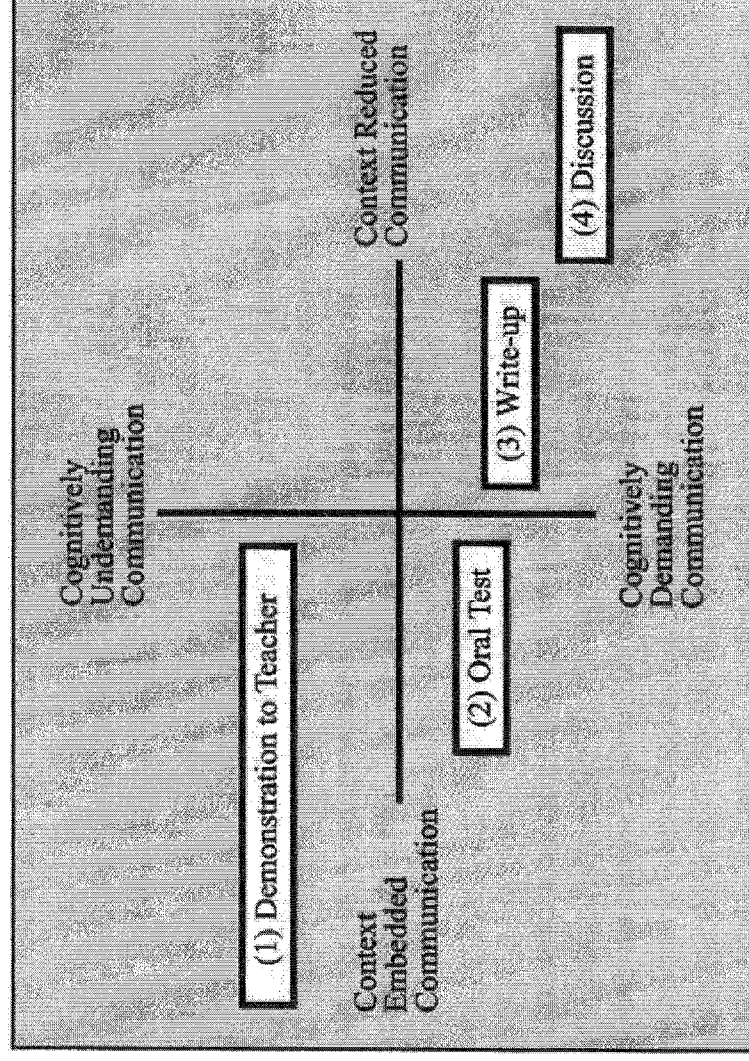
- One-to-one, individual teaching using various objects to measure height (1).
- A demonstration from the front of the room by the teacher using various objects (2).
- Teacher giving oral instructions without objects (3).
- Reading instructions from a work card without pictures (4).



As the diagram indicates, the example of teaching height can be analyzed in terms of the two dimensions. One-to-one individual teaching will fit somewhere in the context embedded, cognitively undemanding quadrant. Using work cards may be closer to the context reduced, cognitively demanding area. Demonstrations and oral explanations appear on the diagonal from 'top left' to 'bottom right', in-between individual teaching and work cards. The exact location of teaching approaches on the graph will vary according to teacher, topic, learner and lesson. The example illustrates that the two dimensions can be a valuable way of examining teaching approaches with bilingual children. The dimensions are also useful for analyzing appropriate methods of **classroom assessment**. The dimensions may help focus on task-related curriculum assessment that is more fair and appropriate to bilingual children than norm referenced testing. A teacher wanting to check progress on measuring height has a choice, for example:

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- **observing** a child measure the height of a new object (1);
- asking the child to give a **commentary** while measuring a new object (2);
- asking the child to provide a **write-up** of the process (3);
- **discussing** in an abstract way the concept of height (4).



In plotting these four methods of assessment (see diagram), placement on the graph will vary with different kinds of tasks and testing procedures. All four quadrants can be 'filled' depending on the student, teacher, topic and test. There is also value in comparing the two graphs presented here. The teaching and learning approach taken may well influence the form of assessment. That is, if a context embedded, cognitively undemanding learning strategy is used with a child, assessment may be on similar lines (e.g. observation of child activity). Equally, a context reduced, cognitively demanding learning strategy suggests a 'matched' method of assessment (e.g. discussion).

CRITICISMS

There are criticisms of Cummins' (1981b) theory of the relationship between language and cognition (Edelsky *et al.*, 1983; Edelsky, 1991; Martin-Jones & Romaine, 1986; Rivera, 1984; Frederickson & Cline, 1990, 2002; Robson, 1995; Wiley,

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1996a; MacSwan & Rolstad, 2003). A detailed rebuttal can be found in Cummins (2000a, 2000b). The criticisms can be briefly summarized as follows:

- (1) Cummins's (1981b) early theory may artificially isolate certain ingredients in a bilingual's cognitive or classroom experience. The attainment of bilingualism or the relationship between bilingual education and school achievement rests on many other factors than are presented in this theory. The early theory was essentially individual and psychological. Socioeconomic class or socio-cultural differences as variables are not a element in the theory. Bilingualism and bilingual education need to consider other variables: cultural, social, political, community, teacher expectations and home factors. Each and all of these variables help explain bilingualism as an individual and societal phenomenon. Cummins (1986, 2000b) addressed these issues in further theoretical formulations.
- (2) Cummins's (1981b) criterion of educational success tended to center on dominant, middle-class indices of achievement. Thus language skills, literacy and formal educational achievement are highlighted. Alternative outcomes of schooling such as self-esteem, social and emotional development, divergent and creative thinking, long-term attitude to learning, employment and moral development were not initially considered.
- (3) The theory has been produced as a *post hoc* explanation of a variety of research findings. The theoretical framework requires direct empirical investigation and confirmation with replication across culture and country, time and educational tradition.
- (4) The labels used may create an over-simplification and a stereotyping of individual functioning and classroom processes. Essentially hypothetical and abstract, the labels may be adopted as concrete and real (see earlier in this chapter).
- (5) The two dimensions are not necessarily distinct, and may not best be represented by two maximally separated (90 degrees apart) axes. When applying Cummins' two dimensions to curriculum tasks, Frederickson and Cline (1990) found it ...

difficult to disentangle the 'cognitive' from the 'contextual'. In some cases, movement along the contextual dimensions has actually been represented on the model as a diagonal shift [on the diagram from top left to bottom right], as it was found in practice that making tasks or instructions more context embedded also made them somewhat less cognitively demanding. Similarly, changes in cognitive demand may result in tasks actually being presented with greater context embeddedness. (p. 26)
- (6) The dichotomy between de-contextualized and contextualized communication may be too simple as all communication appears in some kind of context. For example, teachers' use of the language in mathematics is classroom-based within a mathematics lesson.
- (7) When bilingual children appear to have learning difficulties, a teacher may decide to simplify tasks into smaller and more isolated steps. Such a strategy is

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part of the behavioral objectives approach or a task analysis approach to the curriculum. It may sometimes result in a non-meaningful context to a curriculum task. By making the task context-reduced, the learning may become more difficult rather than easier.

- (8) Attempting to achieve context embeddedness in any curriculum situation requires empathic understanding of a child's cultural background which itself is dynamic and ever evolving. A danger lies in the teacher developing self-defeating stereotyped assumptions about a child's ethnic experience which may transmit low expectations.
- (9) The theory does not make allowances for a child's cognitive strategies in learning, nor their learning style.

CONCLUSION

Early and now discredited ideas of two languages within an individual are represented by two pictures. First, two languages as a balance; second, two languages operating as two separate balloons in the head. Such misconceptions can be replaced by pictures such as the dual iceberg and the three tiered house. Depending on language development in both languages, the cognitive functioning of an individual can be viewed as integrated, with easy transfer of concepts and knowledge between languages. Understanding and thinking will be affected by the contextual support that exists and the degree of cognitive demands in a task. Successful cognitive operations in the classroom will depend on matching curriculum tasks with language competences. Sensitivity to the need for contextual support and the cognitive demands of a classroom are important if an individual is to maximize learning in the curriculum.

KEY POINTS IN THE CHAPTER

- Two languages acting like a balance in the thinking quarters of a bilingual is incorrect. Instead the Common Underlying Proficiency model suggests that languages operate from the same central operating system.
- The Thresholds Theory suggests that bilinguals who have age-appropriate competence in both languages share cognitive advantages over monolinguals.
- There is a distinction between Basic Interpersonal Communicative Skills (BICS) that concern everyday, straightforward communication skills that are helped by contextual supports, and Cognitive/Academic Language Proficiency (CALP). CALP is the level of language required to understand academically demanding subject matter in a classroom. Such language is often abstract, without contextual supports such as gestures and the viewing of objects.
- On average, it takes about two years for a new immigrant to acquire Basic Interpersonal Communicative Skills in a second language, but five to eight

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years to achieve Cognitive / Academic Language Proficiency in that second language.

SUGGESTED FURTHER READING

- BAKER, C. & HORNBEGER, N.H. (eds), 2001, *Introductory Reader to the Writings of Jim Cummins*. Clevedon: Multilingual Matters.
- CLINE, T. & FREDERICKSON, N. (eds), 1996, *Curriculum Related Assessment, Cummins and Bilingual Children*. Clevedon: Multilingual Matters.
- CUMMINS, J., 2000, *Language, Power and Pedagogy: Bilingual Children in the Crossfire*. Clevedon: Multilingual Matters.
- FREDERICKSON, N. & CLINE, T., 2002, *Special Educational Needs, Inclusion and Diversity: A Textbook*. Buckingham (UK): Open University Press.
- VALDES, G., 2004, Between support and marginalisation: The development of academic language in linguistic minority children. *International Journal of Bilingual Education and Bilingualism*, 7, 2&3, 102-132.
- WILEY, T.G., 2005, *Literacy and Language Diversity in the United States* (2nd edn). Center for Applied Linguistics and Delta Systems, McHenry, Illinois.

STUDY ACTIVITIES

- (1) Observe a classroom with bilingual children. Make a 10 minute cassette tape of the discourse between the teacher and various students, and/or between students themselves. Use the concepts and ideas of this chapter to describe and discuss the language used.
- (2) Collect some language samples of the same student when working academically and when holding a simpler conversation (e.g. in the playground). What differences are noticeable? Does the student have any problems in understanding the language of the classroom? What does the teacher do to help students whose language proficiency may hinder them full understanding in the classroom?
- (3) Visit a mathematics lesson where bilingual students are present. Listen and record math terms that may be difficult for the students (e.g. words such as adjacent, opposite, base, chord, even, odd, angle, power, prime, root, similar, table, takeaway and times, that differ from vernacular usage). Talk to the students and locate those terms that they find difficult to understand. Estimate if misunderstandings relate in any way to a difference between conversational and academic language.

